

**Environmental Protection Agency
Watershed Initiative
Nomination of the Kenai River Watershed**

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REGION 10

EPA Watershed Initiative - Kenai River Watershed Nomination

Abstract

The Kenai River is one of the most important watersheds in Alaska, providing world-class salmon fishing and wilderness recreation. This nomination addresses two watershed threats: non-point source hydrocarbon pollution caused by outboard motors, and stream bank erosion caused by boat wakes. Project activities will reduce hydrocarbon emissions on the Kenai River by implementing market-based incentives to decrease the use of 2-stroke motors by individuals and guides. The project also seeks to reduce the effects of boat wakes on stream bank erosion by implementing guide incentives and voucher programs to encourage the use of “low or no wake” boat hulls, while monitoring and evaluating boat wake effects on stream banks. The Kenaitze Indian Tribe I.R.A., the Alaska Department of Natural Resources and the Kenai Watershed Forum will collaborate to implement project activities. \$848,632 is requested in EPA funding for this initiative, with a local match of \$1,556,600.

EPA Watershed Initiative - Nomination of the Kenai River Watershed

A. Characterization of the Watershed and the Watershed Planning Effort

Biological, Physical, and Social Characteristics - The Kenai River, located on the Kenai Peninsula in south central Alaska, flows from the outlet of Kenai Lake 82 miles to Cook Inlet. The Kenai River drains more than 2,200 square miles, and supports 34 fish species including Rainbow Trout, Dolly Varden Char, Chinook, Coho, sockeye, and pink salmon. It is one of the most important watersheds in Alaska for its fishing and recreation opportunities. Within two hours drive from Anchorage, the watershed is accessible to over 70% of the state's population and accounts for 19 percent of the state's sport fishing. The watershed supports multi-use recreational activities including rafting, kayaking, motor boating, drift guiding, hunting, snowmobiling, hiking, and camping. One non-general National Pollutant Discharge Elimination System (NPDES) permit is issued to the Soldotna Waste Water Treatment facility, which discharges into the Kenai River. Three canneries near the mouth of the river hold general NPDES permits as seafood processors in Alaska. **Threats/ Problems Facing the Watershed:** Studies conducted with funding provided by US EPA through Sec. 104(b) 3 of the Clean Water Act, the U.S. Geologic Survey (USGS) and the U.S. Army Corps of Engineers (ACOE) indicate the most immediate concerns facing the Kenai River are related to recreational impacts from in-river motorized boat use. This nomination focuses on two specific threats: non-point source hydrocarbon pollution caused by outboard motors, and stream bank erosion caused by boat wakes. Hydrocarbon levels exceeding standards established by the Alaska Department of Environmental Conservation (ADEC) for fish and aquatic life, have been found in areas of heavy boat use. Habitat loss due to boat wakes as a primary source of accelerated erosion has been identified in studies by the USGS, ACOE and Alaska Departments of Fish and Game (ADF&G) and Natural Resources (ADNR). In preparing this nomination, we considered other known

threats: non-point source pollutants, such as run-off from paved areas, septic systems, treated sewage, and discharge from canneries; all-terrain-vehicle crossings of streams channels; culverts which cause habitat fragmentation; invasive species; over-harvest of salmon and trout, livestock grazing; industrialization and development; and lack of data to aid in planning/protection efforts.

Description of the Watershed Plan- *The Kenai River Comprehensive Management Plan*

(KRCMP), (rev. 12/97), the watershed plan upon which this nomination is based, resulted from several years' collaboration between the Kenai River Advisory Board, ADF&G, ADEC, DNR, US EPA, USFWS, USGS, and the governments of Kenai, Soldotna, and the Kenai Peninsula Borough. Currently, the advisory board meets monthly to discuss the watershed, with participation by the Kenaitze Indian Tribe, Kenai River Center, and the Kenai Watershed Forum.

The KRCMP thoroughly describes the watershed assessment and incorporates elements of all local and federal management plans as they relate to the Kenai watershed. This nomination resulted from meetings begun in 2002 with the Kenaitze Indian Tribe, ADNR, USFWS, ADF&G, Kenai River Center, the Borough, and the Kenai Watershed Forum, with input sought from ADEC, USEPA, and the Chugach National Forest. The planning group systematically reviewed current watershed assessments, discussed problems/threats, and adopted these

watershed goals directly from the KRCMP: **1) To ensure that the environmental integrity of the Kenai River watershed is maintained or enhanced, managed on an ecosystem basis, and that the developments within riverine areas and their adjacent uplands are constructed, sited, and operated in such a manner that the river's environmental integrity is ensured. 2) To protect, perpetuate, and effectively manage the fishery and wildlife resources, waters, and habitats of the Kenai River ecosystem.** In support of these goals, the planning group decided that focusing efforts on reducing the impacts from motorized boat use will have the most immediate and tangible measures of success.

B. PROJECT DESCRIPTIONS: To accomplish the watershed goals identified above, this nomination uses market based approaches which encourage the use of best available technology to: (a) improve the water quality of the Kenai River in the lower 10 miles of the river where exceedences of current state standards have been documented, and (b) reduce wake-induced erosion of property on stream banks, which damages juvenile fish rearing habitats and reduces private property values. Both water quality and boat wake monitoring will provide data for evaluating the effectiveness of the proposed approaches. Real incentives are critical to changing the existing use patterns and encouraging recreational users to switch to lower impact equipment. The project will tailor incentives to the target user which will include: a voucher for removing inefficient motors used primarily by the public; vouchers to promote the use of “low or no wake” boat hulls on the river; and reduction in permit fees for converting high wake producing boats, used primarily by fishing guides, to “low or no wake” boats. The project’s creative approach offers solutions that minimize disruption to the local economy and recreational opportunity, as well as measurable, quantifiable indicators of success.

1) Two-Stroke Boat Motor Buyback Incentive Program – The goal of this program is to reduce the effects of hydrocarbon emissions from two-stroke boat motors on the Kenai River, by providing cash vouchers to private consumers towards the purchase of a non-motorized drift-boat or a 2006 manufacture emission compliant motor, when the two-stroke motor is traded in.

Benefits to the Watershed: Excerpt from the **Peninsula Clarion** (November 21, 2003),
“Preliminary results of a study done by the Alaska Department of Environmental Conservation suggest that motorboat traffic is responsible for the majority of hydrocarbon pollution found in the Kenai River. The Kenai River Petroleum Source Assessment 2003, conducted last summer by DEC researchers Tim Stevens and Kent Patrick-Riley, found that when boat traffic is highest on the river, pollution levels can rise to near or above the 10 parts per billion standard set by the

state... Overall, it's estimated by DEC that at least 10,000 gallons of petroleum products entered the river this summer... highest levels of hydrocarbon contamination were found during the highest levels of boat use. Patrick-Riley said that when the July king salmon fishery began to pick up, a direct rise in hydrocarbon levels was observed.” The preliminary results described by the ADEC were follow-up studies that verified data collected by the Kenai Watershed Forum. The January 2003 KWF fact sheet documented similar findings and estimated that 34% of boat motors used on the Kenai River are older two-stroke engines that produce 3 to 5 times the emissions of 4-stroke motors. Almost all 2-stroke motors in use are on non-guided private boats.

Objective: The objective of this project component is to reduce the hydrocarbon pollution load in the Kenai River to levels that DO NOT exceed state standards. By removing 200 of the “worst offender” motors from the river within three years, we expect to see at least a 20% decrease in the hydrocarbon concentration. The outreach and education component will advertise this program component and inform the public about the benefits to the river of conversion to two-stroke engines. A voucher program will be developed to determine eligibility of private boat owners and provide a cash incentive of \$500 per two-stroke engine traded in. The two-stroke engines will be disabled and shipped to a recycling center to prevent their re-use on the river. The Kenai Watershed Forum will work with local dealers to use the vouchers and encourage matching dealership rebates. The KWF will also work with the Kenaitze Indian Tribe (KIT) and ADNR on a “river friendly guide” designation, which will result in a \$100 reduction in permit fees for participants who use 4-stroke motors or non-motorized boats on the Kenai River.

Schedule: In 2004, the outreach and education component will begin **within 30 days of grant funding** and will be ongoing throughout the duration of the project. The vouchers will be fully operational **within 90 days of grant funding** and will continue until all grant funds for this item are expended. Monitoring water quality as a tangible measure of success will begin in **July 2004**

and will continue in **2005 and 2006**, to be carried out under an existing, approved Quality Assurance Project Plan. The resulting data will be collected in a systematic manner using methods established in the past 4 years. With comparable data, we will know if we are meeting our goal of reducing hydrocarbon pollution to levels that do not exceed state standards. The KWF will work with the ADEC to carry out these studies. Also in **2005**, the KWF will collaborate with ADNR and the Kenaitze Indian Tribe to implement the “river friendly guide” criteria and permit fee reductions.

Cost Summary: Two-stroke buyback incentives: \$100,000 requested in EPA funds (200 vouchers @ \$500/each); consumer match at the time of purchase estimated at \$3,000 per motor for a total cost share of \$600,000 for this item. This proposal requests \$45,000 for outreach/education, which will include Watershed Forum staff time as well as print materials and advertising costs. Disposal of motors will cost \$125 each, for a total of \$25,000 requested in EPA funds. Water quality monitoring costs are \$60,000/year for three years for a total request of \$180,000, to be matched by \$75,000 cash by the Watershed Forum. \$50,000 State in-kind match will be provided through permit fee reductions for 250 “river friendly guides” who use 4-stroke engines or non-motorized boats during the 2005-06 permit years.

Monitoring and Evaluation: Four years of consistent monitoring with consistent results provides the baseline data for correlating hydrocarbon concentrations with outboard motor boat usage. We will continue to monitor hydrocarbon concentrations at four index sites in the lower 20 miles of the Kenai River every week during the month of July for each of the three years of the project. We will continue to correlate the hydrocarbon concentrations with aerial boats counts and on the water observations of the ratio of two-stroke to four-stroke motors. Weekly sampling for Benzene, Toluene, Ethylbenzene and Xylene isomers (BTEX) will occur in the lower river area of concern during peak recreation times. Data collection will be consistent with the

methodologies that identified the concern and will provide the basis for a fair measure of success. We will consider the project successful if: a) there is a measurable reduction in the ratio of 2-stroke to 4-stroke motors on the river and; b) if there is a 20% decrease in the pollution load associated with fuel.

Consistency with State and Federal Standards: The goal of this program is to improve the water quality of the Kenai River to levels below the DEC standard for hydrocarbon contamination of 10 parts per billion. This program also supports the EPA regulations, which phase out certain 2-stroke engine manufacture by 2006.

2) Boat Wake Erosion Reduction Program – The goal of this component is to reduce the effects of boat wakes on stream bank erosion, through a “river friendly guide” incentive program featuring permit fee reductions; a voucher program to encourage private consumers to select flat bottom or non-motorized boats when purchasing a boat for use on the Kenai River; and continued monitoring and evaluation of boat wake effects on stream banks.

Benefits to the watershed: A previous USGS hydrological study documented that powerboats have caused significant erosion in some stretches of the river. Erosion has resulted in the loss of private as well as public property, river access infrastructures, and juvenile salmon rearing habitat. The proposed project seeks to reverse this trend by influencing private and commercial boat operators to use river friendly “low or no wake” hulls. The project will also further quantify boat wake variables such as passage frequency, position, and method of operation in order to develop further recommendations for boat usage in the river that prevents future erosion.

Objectives: 1) Develop a “river friendly guide” designation for 250 guides (out of an average of 350 guides registered per year), with a \$100 reduction in permit fees for participants who use flat bottom or non-motorized boats. 2) Encourage the use of flat-bottom or non-motorized boats on the Kenai River, through the provision of voucher-based cash incentives to 200 boat operators.

3) Monitor the physical impacts of powerboat wakes and wave variables on Kenai River shorelines, and effects on fish habitat productivity, in order to document program effectiveness and develop further boat operation guidelines to reduce erosion.

Schedule: Within 60 days of grant funding, (2004) Alaska Department of Natural Resources and the Army Corps of Engineers will commence logistical planning, site selection for field studies, and planning for aerial photography to compare stream banks to previous years. **Within 90 days of grant funding (2004)**, KWF and the Kenaitze Tribe will work together to develop and implement the voucher incentive program, providing two hundred (200) 15%-of-purchase, up to \$500, vouchers for the purchase of flat bottom or non-motorized boats by private consumers. ADNR will also develop the “river friendly guide” permit fee reductions by **spring of 2005**. Also beginning in **spring of 2005**, ACOE will commence field work to evaluate boat wake impacts on river banks, first by selecting at least four sites that encompass various bank slopes, bank soils, wave energy, extent of erosion, level of traffic, vegetative cover, human foot traffic, structures, and near-bank channel bottom configuration. Wave gauges and time-lapse video photography will monitor boat passages past the study location, specifically addressing the frequency of passage and the type of operation (hull configuration, passenger loading, etc.). The field evaluations will identify characteristics typical of wave-induced erosion as well as other erosion and failure mechanisms. Soil samples will be collected and new aerial photography will be conducted and compared with existing aerial photography from past years, to measure how bank erosion has changed over time. The field work will attempt to determine the extent to which encouraging a conversion to “low or no wake” boats has resulted in a decrease in measurable bank erosion, and what other alternatives might be implemented to reduce boat wave caused bank erosion. **In 2006**, a final report of wake effects will be prepared, to include recommendations on measures to mitigate erosion. This will be followed by a public

involvement process conducted with the KRSMA Advisory Board to discuss the types of management alternatives to reduce boat wave caused erosion. Alternatives that might be considered include restricting hull shapes that produce significantly higher wave heights and energy, restricting boat weights (passenger loadings, boat weight itself) or restricting certain boating methods which produce significantly higher wave heights and energy. In the **2006 field season**, ADNR, working with the Kenaitze Tribal Coordinator will monitor boat types and develop a data base identifying boat hull types, passenger loading, etc. to monitor how effective the voucher and educational programs are working in reducing the number and type of boating methods associated with greater erosion.

Monitoring and Evaluation: By the third year of the project, 250 “river friendly” guides will be enrolled who meet criteria for “low or no wake” boats and 4-stroke engines and 200 flat bottom or non-motorized boats will have replaced V-hull boats on the river. Visual counts of boat types by ADNR and KIT will show that the proportion of “low or no wake” boats to V-hull boats on the river has increased by 30% by the end of three years. Wake measures should show measurable reduction in wake-induced erosion. A list of recommendations will be available; those implemented on the river will be noted, as well as the effects on future wake activity and stream bank erosion, which will be monitored by the project even after funding has expired. The field data to be analyzed includes wave and camera data, aerial and ground photography, bank soils characterization, bank geometry measurements, etc. These various site characteristics will be tested for correlation to observed erosion and related failure mechanisms. ADNR and KIT will be jointly responsible for monitoring and evaluating data for this component.

Cost Summary: “Low or no wake” boat voucher program: \$100,000 requested in EPA funds (200 vouchers at \$500 each); required consumer match of an estimated \$3,500 per boat hull for a total \$700,000 match from individuals purchasing flat bottom or non-motorized boats. \$40,000

match – Kenai River sport fishing guide permit fee reduction for operating a river friendly boat hull during commercial activities (assumes 150 guides will participate in 2005, and 250 guides will participate in 2006, @ \$100 in permit reductions each). Wake monitoring and analysis: \$220,000 requested for ACOE/Engineering Research Development Center for design and development of equipment, fieldwork, data analysis, report preparation, and travel. \$30,000 requested for contract for aerial photography of the Kenai River. \$50,000 – state match contribution of staff, equipment, vehicles and transportation during the 2005 field monitoring project, plus follow-up monitoring by ADNR in 2006. KIT Coordinator costs associated with all watershed program components - \$75,000 salary (.5 FTE for 3 years), \$14,550 fringe, \$5,301 travel; in-kind match of \$16,600 includes office rent, furnishings, computer, and GIS software.

Consistency with State and Federal Standards: This project implements one of the recommendations within the 1997 Kenai River Comprehensive Management Plan, and is consistent with Alaska DNR’s mission to protect the Kenai River’s fish and wildlife resources while managing the river for recreational use.

Project Management: The Kenaitze Indian Tribe, I.R.A. will be the lead agency (grantee), responsible for developing MOA’s with each project agency, and overseeing plan implementation, project evaluation, and quarterly reports, in conjunction with project managers for the KWF and ADNR. The Kenaitze Indian Tribe, incorporated in 1971, has administered over 652 grants and contracts to date, with a \$7 million annual budget. The Tribal Environmental Officer, Brenda Trefon, has a Master’s degree in rural development, with eight years’ management experience, including over four years administering EPA grants. Chris Degernes, ADNR’s manager for the Kenai River Special Management Area, has managed recreation use on the river for the past 14 years, as well as coordinated the on-going implementation of KRCMP recommendations. Nationally recognized ACOE hydrologists will

provide wake monitoring, analysis, and technical expertise to the project. They initially studied boat wakes in 2000. The Kenai Watershed Forum began its water quality monitoring program in 2000, in cooperation with three local governments, three state, and two federal agencies, and four non-profits. Executive Director Robert Ruffner has M.S. in geology and civil engineering and has been with the project since 1998. KWF has solid experience with EPA and sec. 319 grants.

Outreach and education program: The Kenaitze Tribe, the Alaska DNR and the Kenai Watershed Forum will implement an outreach/educational program with other local partners, such as the Kenai River Center and the Kenai River Advisory Board. The program will educate boaters about more river friendly boating methods and encourage the use of non-motorized options, low emission motors and low wake producing boats. The project will also recognize Kenai River recreational users who use equipment that minimizes environmental impacts to the resources, by developing and providing a decal for each boat whose owner uses low impact equipment. The partner agencies will make presentations at environmental and community meetings, such as the River Management Society, the annual Alaska Forum on the Environment in Anchorage and the annual Kenai River Festival. The project will also make presentations at annual sports and boating trade shows in Anchorage and the Kenai Peninsula and monthly Kenai River Advisory Board meetings, as well as through displays and materials distributed through the Kenai River Center. Other dissemination efforts will include newsletters, brochures, and press releases, and sharing with other watershed groups, such as those involved with the Willow and Susitna River watersheds, that may be facing similar threats. The KIT Coordinator will play a special role educating the over 3,500 area Natives and Tribal members who use the river, helping them to access the project's incentives and engaging organizations such as the Alaska Native Health Board and the Alaska Federation of Natives in project dissemination and support. The KIT Coordinator will also monitor and report all outreach and partnership activities.

Table 1. BUDGET INFORMATION – EPA Watershed Initiative Grant Program

SECTION A – BUDGET SUMMARY					
Watershed Project, Activity, or Work Plan Element	Federal	Non- Federal	Total		
1. Two-stroke buyback incentives	\$367,500	\$725,000	\$1,092,500		
2. Boat Wake Erosion Reduction	367,500	815,000	1,182,500		
3. Lead Agency Coord/Outreach	113,632	16,600	130,232		
Totals	\$848,632	\$1,556,600	\$2,405,232		
SECTION B – BUDGET CATEGORIES					
	Watershed Project, Activity or Work Plan Element				Total
Budget Categories	1	2	3	4	
a. Personnel	\$	\$ 50,000	\$ 75,000		\$ 125,000
b. Fringe Benefit		10,000	14,550		24,550
c. Travel		5,000	5,301		10,301
d. Equipment		5,000			5,000
e. Supplies		5,000	5,800		10,800
f. Contractual	325,000	250,000			575,000
g. Construction					
h. Other	750,000	840,000	10,800		1,600,800
i. Total Direct Charges	1,075,000	1,165,000	111,451		2,351,451
j. Indirect costs					53,781
	17,500	17,500	18,781		
TOTALS	1,092,500	1,182,500	130,232		2,405,232